DS Lab Challenges

Challenge #1

- Write an MPI program that will broadcast an entire array to a set of nodes
  - The array should contain 30 random ints
  - Make sure to deallocate memory

✳ *If this seems too easy, try to write the code without referencing the MPI_notes document at all.*

Challenge #2

- Write an MPI program where:
  - each node generates a random number
  - & subsequently sends to the coordinator
  - which will then display the total sum

✳ *Hint: Reduce is your friend*

Try to write as much code as you can without referencing the MPI_notes document

Challenge #3

- Write an MPI program where:
  - each node will sleep for a random amount of time
    - amount of time should be between 0-4
  - print out “rank X sleeping” and the amount of time to sleep
  - on awakening, the node will then synchronise with the others
  - print “rank X synchronised” after synchronisation

Try to write as much code as you can without referencing the MPI_notes document

Challenge #4

** don’t forget to deallocate memory**

- Write an MPI program where:
  - Your name and student number are printed to screen *once*
  - The master node generates an array of 80 integers, numbers 0-79.
  - Master then sends equal sized chunks to each of the nodes
  - Slave node will receive its chunk and call printArray()
  - Create a printArray() method that:
    - takes as input: an array, the array size, and the current rank
    - prints: “Rank X received:” and the received array
- Make the code adaptive, so that you can run it with different amounts of nodes
- Run with 4 and 8 nodes.